

CLAIMS

1. An air cooled gas discharge detector comprising:
a gas discharge tube having an outer surface;
an air passageway in contact with at least a portion of the outer surface of the gas discharge tube;
an entry aperture for introducing air into the air passageway;
an exit aperture for allowing air to flow out of the air passageway; and
an air source for supplying a flow of air into the entry aperture for cooling the outer surface of the gas discharge tube.
2. The detector of claim 1 wherein the discharge is powered by radio frequency or microwave energy.
3. The detector of claim 2 wherein the radio frequency or microwave energy is generated by a magnetron.
4. The detector of claim 3 wherein the radio frequency or microwave energy is introduced into a cavity defined by an inner wall, two side walls and an outer wall, and wherein the inner wall surrounds at least a portion of the gas discharge tube.
5. The detector of claim 4 wherein the air passageway extends alongside at least a portion of an exterior of the side walls.
6. The detector of claim 5 wherein the gas discharge tube is made of sapphire.
7. The detector of claim 6 wherein the air source is an on board air pump.
8. The detector of claim 6 wherein the air source is a central compressor.

9. A method of cooling a gas discharge tube in a gas discharge detector comprising:
providing a gas discharge tube having an outer surface; and
passing a flow of air over at least a portion of the outer surface of the gas discharge tube.

10. The method of claim 9 further comprising generating the flow of air by an on board
air pump.

11. The method of claim 9 further comprising generating the flow of air by a central
compressor.

12. The method of claim 9 further comprising powering the gas discharge tube with
radio frequency or microwave energy.

13. A gas discharge detector comprising:
a gas discharge tube;
a power source for providing energy to the gas discharge tube; and
an apparatus for air cooling the gas discharge tube.

14. The detector of claim 13 wherein the discharge is powered by radio frequency or
microwave energy.

15. The detector of claim 14 wherein the radio frequency or microwave energy is
generated by a magnetron.

16. The detector of claim 15 wherein the gas discharge tube is made of sapphire.

17. The detector of claim 16 wherein the apparatus for air cooling the gas discharge
tube includes an on board air pump.

1 18. The detector of claim 16 wherein the apparatus for air cooling the gas discharge
2 tube includes a central compressor.

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4 19. The detector of claim 15 wherein the radio frequency or microwave energy is
5 introduced into a cavity defined by an inner wall, two side walls and an outer wall, and wherein the
6 inner wall surrounds at least a portion of the discharge tube to form an air passageway.

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8 20. The detector of claim 19 wherein the air passageway extends alongside at least a
9 portion of an exterior of the side walls.

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